graded the TEE as confirming (Conf) the MD's dx, providing new information, or both (New/Conf). There were 711 patients studied with a complication rate of 1.3%. The most common referral diagnoses were cardio-embolic source (EMB) (26.5%), endocarditis (Endo) (19.2%), native valve dysfunction (10.7%), and congenital heart disease (CHD) (6.8%).

TEE revealed new information in over 60% of pts, and was especially valuable in EMB pts. Thus, TEE provides significant new information not expected clinically pre-test.

3:00

757-5 Frequency of Potential Cardiac Sources of Emboli in Transient Ischemic Attack, Peripheral Embolus and Amaurosis Fugax

N. Calzada, R.A. Longaker, M.F. Stoddard. *University of Louisville, Louisville, KY, USA*

Transesophageal echo (TEE) is a useful diagnostic tool in pts with potential embolic stroke (CVA). Less is known about the yield of TEE for other potential embolic events such as transient ischemic attack (TIA) and peripheral embolus (PE). Amaurosis fugax (AFG) has not been reported. Thus, 610 randomly selected pts (549 M/61 F) mean age 63 ± 11 yrs with recent CVA (n = 378), TIA (n = 162), PE (n = 45) and AFG (n = 25) were studied by TEE. 101 age-matched pts without emboli were controls (Cont).

Results: The frequency of at least 1 potential embolic source (ES), such as left atrial and ventricular thrombus (LA/LV-thr), vegetation (Veg), ≥5 mm aortic debris (Ao-plaque), Hanley class II-III patent foramen ovale (PFO) and atrial septal aneurysm (ASA), was higher among CVA, TIA and PE vs Cont, but did not differ between AFG vs Cont (table).

	LA/LV-thr	Veg	Ao-plaque	PFO	ASA	≥1 ES
Cont	1 (1%)	1 (1%)	19 (19%)	14 (14%)	4 (4%)	39 (39%)
CVA	24 (6%)[a]	20 (5%)	77 (21%)	76 (20%)	28 (7%)	218 (58%)[c]
TIA	12 (7%)[b]	7 (4%)	49 (30%)[a]	36 (22%)	19 (12%)[a]	113 (64%)[d]
PE	7 (16%)[c]	1 (2%)	12 (27%)	7 (16%)	1 (2%)	31 (69%)[c]
AFG	1 (4%)	0 (0%)	4 (16%)	6 (24%)	4 (16%)a	12 (48%)

[a]$p < 0.05$, [b]$p < 0.02$, [c]$p < 0.001$, [d]$p < 0.0001$ vs Cont

Mean ejection fraction and frequency of regional LV wall motion abnormality was similar among groups. *Conclusions:* Unlike CVA, TIA and PE, TEE fails to identify a higher frequency of embolic sources in AFG vs Cont, and thus does not support a cardiac embolic origin for AFG.

3:15

757-6 Is Transesophageal Echocardiography the Imaging Modality of Choice in Patients With Cerebral Ischemia, to Rule out a Cardiac Source of Embolus? A Cost-effective Study

B.S. Maini, R.A. Castillo, N. Nallamothu, A. Banerjee, F.A. Chaudhry. *Allegheny University of the Health Sciences, Philadelphia, PA, USA, Drexel University, Philadelphia, PA, USA*

Transesophageal echocardiography (TEE) is more sensitive than transthoracic echocardiography (TTE) in detecting cardiac source of emboli. However, the cost-effectiveness of TEE as the first imaging modality in evaluating pts with cerebral ischemia remains controversial. Forty-four consecutive pts referred for both TEE and TTE to rule out a cardiac source of embolus were evaluated. In 10 pts, a cardiac source of embolus was identified by TEE compared to none by TTE. Medicare reimbursement for TTE, TEE and hospital costs were used for cost analysis. Using the best estimate for test characteristics and costs, the most cost-effective strategy was dependent on the probability of disease (POD) based on predetermined clinical parameters, including atrial fibrillation, CAD, peripheral vascular disease, prosthetic valves, and congenital anomalies. TEE should be the first imaging modality for ≥54.1% POD and TTE for ≤54% POD, but may eventually require a subsequent TEE. When divided by specialty, pts admitted under cardiology service are more likely to be evaluated by TEE as the first modality in comparison to pts admitted under general medicine service (43% vs. 5%, respectively).

Conclusions: Based on current practice at our institution, the cost-effective evaluation of suspected cardiac source of embolus by TEE or TTE may be improved by considering the probability of disease. In pts with a moderate to high POD, TEE alone is more cost effective.

758 Basic Myocardial Structure, Function, and Disease

Tuesday, March 18, 1997, 2:00 p.m.–3:30 p.m.
Anaheim Convention Center, Room A6

2:00

758-1 Abnormalities of Left Atrial Reservoir, Conduit and Booster Pump Functions in a Rapid Pacing Model of Atrial Myopathy

B.D. Hoit, Y. Shao, M. Gabel, R.A. Walsh. *Division of Cardiology, University of Cincinnati, Cincinnati, OH, USA*

In order to develop and characterize a model of atrial myopathy (AMYO), eight dogs were atrially paced at 400 bpm (3:1 ventricular response) for 6 weeks, and instrumented with left atrial (LA) and left ventricular (LV) sonomicrometers and micromanometers. LA volume (LA Vol), ejection fraction (EF), mean normalized systolic ejection rate (SER), and reservoir fraction (RES, defined as the fractional change in LA volume during ventricular systole), were compared with data from 6 sham-operated controls (SHAM) at matched LA pressure of 10 mmHg.

	LA Vol	EF (%)	SER (circ/s)	RES
AMYO (n = 8)	10.3 ± 4.0	2.0 ± 1.4*	0.3 ± 0.1*	0.07 ± 0.04*
SHAM (n = 6)	7.9 ± 4.4	13.0 ± 4.0	2.8 ± 1.2	0.35 ± 0.06

Data are mean ± SD; *$p < 0.05$ vs. SHAM

Rapid pacing did not directly influence LV inotropy or lusitropy, as LV dP/dt and the time constant of LV relaxation were similar in AMYO and SHAM. In contrast, the LA diastolic stiffness constant was significantly greater in AMYO than SHAM (5.7 ± 2.3 vs. 3.4 ± 0.6 mmHg), and the ratio of transesophageal echo-determined pulmonary venous systolic to diastolic integrated flow, a measure of relative reservoir to conduit function of the LA, was less in AMYO compared to SHAM (0.41 ± 0.19 vs. 0.68 ± 0.23 cm, $p < 0.05$). Thus, in this model of isolated atrial myopathy increased atrial stiffness and enhanced conduit function compensate for impaired atrial booster pump and reservoir functions.

2:15

758-2 Divergent Time-dependent Effects of Tumor Necrosis Factor-Alpha on Relaxation Restitution and Tau in Closed-Chest Dogs

D.R. Murray, S.D. Prabhu, G.L. Freeman. *The University of Texas Health Science Center at San Antonio and Audie L. Murphy VAH, San Antonio, TX, USA*

Mechanical and relaxation restitution (MR and RR) are thought to be physiologic correlates of Ca^{2+} handling by the sarcoplasmic reticulum (SR). Although we have recently shown that the proinflammatory cytokine tumor necrosis factor-α (TNFα) prolongs MR in a time-dependent manner, the effect of TNFα on RR is not known. Accordingly, we studied 5 autonomically blocked (propranolol 2 mg/kg, atropine 2 mg) conscious dogs instrumented with LV manometers and 3 diameter gauges before and after TNFα infusion (40 μg/kg over 1 hour). After priming at a basic cycle length of 375 ms, test pulses were delivered at graded extrasystolic intervals (ESIs). The relaxation responses of extrasystoles were assessed using peak negative dP/dt, normalized to the preceding control beat, and related to the ESI. Values of the early RR time constants (TC) and steady state measures of tau, the time constant of isovolumic relaxation, are shown (* $P < 0.05$ versus Pre-TNFα):

	Pre-TNFα	1 Hr Post	4 Hr Post	7 Hr Post	24 Hr Post
TC (ms)	37.6 ± 8.1	40.8 ± 1.7	56.7 ± 3.8*	50.7 ± 10.6	45.5 ± 11.8
Tau (ms)	28.3 ± 1.6	24.7 ± 0.9*	30.3 ± 2.5	32.0 ± 2.7*	31.2 ± 2.6*

We conclude: TNFα impairs RR 4 hours after treatment, with subsequent recovery at 7–24 hours despite prolongation of tau. These data indicate that TNFα alters relaxation behavior in the intact heart. Divergent effects of TNFα on RR and tau suggest that these two parameters represent different underlying mechanisms.